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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANEY, CAROL DIANE

ART UNIT PAPER NUMBER

1745

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/025,324

Applicant(s)

HATAYA, KOJI

Examiner

Carol Chaney

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-21 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-21 and 23-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17-21 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "low molecular weight" in claims 17-21 is a relative term which renders the claim indefinite. The term "low molecular weight" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

In claim 17, the time for dissolving a compound described as being "in advance" is indefinite because the time or activity the dissolving should be in advance of is not clear.

In claim 17, it is unclear if "low molecular weight compound that is polymerizable in the electrolyte" is the same or different from the "monomer" described in claim 16.

In claim 18, it is unclear if the "low molecular weight compound having a single reaction point" and the "low molecular weight compound which functions as a crosslinking agent, having two or more reaction points" are the same or different from "low molecular weight compound that is polymerizable in the electrolyte" recited in claim 17.

Claim 19 recites the limitation "homopolymer" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 19 fails to describe a function for, or a step in the claimed method, which incorporates the "homopolymer" recited.

In claim 28, an "undiluted solution of electrolyte..." is indefinite because the meaning of "undiluted" is not defined. Applicants describes, for example, a propylene carbonate solution having dissolved therein 1 M LiClO₄ as an electrolyte solution. (See page 27, lines 12-14 of applicants' specification.) This electrolyte solution would be "diluted" from a 1.5M solution of LiClO₄ in propylene carbonate, for example.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16, 17, 20, 21, 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xiang et al., US 2003/0104282 A1.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Xiang et al. disclose forming gel polymer lithium ion batteries by preparing an electrolyte precursor solution, which involves combining an electrolyte solution with a

monomer. Xiang et al. then layer cathode and anode electrode structures between a non-woven fabric separator, which makes a final battery. The cathode-separator-anode structure is soaked in the electrolyte precursor, such that the electrolyte solution and monomer solution are introduced into the final battery form. The assembly is sealed under vacuum, and then heated so that the electrolyte and polymer precursor are polymerized. (See paragraphs 37-39.) The gel polymer is prepared by mixing monomers or co-monomers with a lithium salt, at least one nonaqueous solvent and thermal initiator or a free-radical generating activator. The monomers can have one or multiple functionalities. Meth(acrylates) are specifically mentioned, which one of ordinary skill in the art would understand to encompass ethylene dimethacrylate. (See paragraphs 26-28.)

With regards to claim 27, the polymerization disclosed by Xiang et al. takes place from "about 10 minutes to about one hour." (See paragraph 34.) This range of times is considered to encompass "approximately 80 minutes".

The disclosure of Xiang et al. differs from applicants' claims in that Xiang et al. do not specifically disclose a first portion of the electrolyte solution forms a gel with the crosslinked polymer and a second portion of the electrolyte forms a separated phase of liquid electrolyte solution. However, since the materials and processes used by Xiang et al. and the applicants are similar, the resulting structure described by Xiang et al. would be similar to that disclosed by applicant.

With regards to claim 25, although Xiang et al. do not disclose selecting mass ratios of electrolyte and monomer, it would have been obvious to one of ordinary skill in the art to

adjust the amounts of electrolyte and monomer. The ratio is considered a result-effective variable, since variations in the ratios will vary ionic conductivity of the final electrolyte. The discovery of the optimum of result effective variable in known process is ordinarily within the skill of art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Venugopal et al., US Patent 5,837,015 A.


Ehrlich US Patent 6,203,949 B1

Kang et al., US Patent 6,627,344 B2

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Carol Chaney
Primary Examiner
Art Unit 1745

13 November 2004